

COUNTY OF STEARNS

Environmental Services Department

Administration Center Rm 343 • 705 Courthouse Square • St. Cloud, MN 56303
320-656-3613 • Fax 320-656-6484 • 1-800-450-0852

January 19, 2005

Mr. Robert Schroeder, Chair
Minnesota Environmental Quality Board
658 Cedar Street
St. Paul MN 55155



Dear Mr. Schroeder:

Please find enclosed a copy of the Environmental Assessment for a new 115 kV transmission line and substation upgrade proposed by Great River Energy (GRE) and Stearns Electric Association (SEA) near Rockville in Stearns County, Minnesota. The applicants chose to permit the project under Minnesota Rules pt. 4400.5000, Local Review of Proposed Facilities. Stearns County is the local unit of government that has jurisdiction over the project.

A notice of the proposed project for publication in the January 31, 2005 EQB Monitor is also enclosed.

If you have any questions regarding this project, please give me a call at 1-800-450-0852.

Sincerely,

Donald W. Adams
Environmental Services Director

Enc.

Cc: Rick Heuring, GRE

6.0 REFERENCES

Electric and Magnetic Fields (EMF): Environmental Health in Minnesota.
<http://www.health.state.mn.us/divs/eh/radiation/emf>

Environmental Impact Analysis Handbook. 1980. Edited by Rau and Wooten.

Minnesota Department of Health. 2002. *A White Paper on Electric and Magnetic Field (EMF) Policy and Mitigation Options*.

National Institute of Environmental Health Sciences. 2002. *EMF. Electric and Magnetic Fields Associated with the Use of Electric Power*. National Institutes of Health.

National Research Council. 1997. *Possible Health Effects of Exposure to Residential Electric and Magnetic Fields*.

U.S. Department of Energy, Bonneville Power Administration. Undated. *Corona and Field Effects Program Version 3.0 Computer Program (Public Domain Software)*. BPA, P.O. Box 491-ELE, Vancouver, WA 98666.

A survey on the project was sent by Stearns County to all landowners along the proposed corridor on December 2, 2004 to satisfy the requirement in the EQB rules for public involvement in preparation of the environmental assessment. The survey and responses received are provided in Appendix D. The CUP request process is also open to the public as part of the respective review by the Stearns County Planning Commission at its regularly scheduled meetings. Prior to the public hearing, notices are sent out to landowners located within one-quarter mile of the project corridor and public hearing notices are published in the Stearns County official newspaper.

5.4 REQUIRED PERMITS AND APPROVALS

Government Unit	Type of Approval	Regulated Activity	Status
Stearns County	Construction Site Permit	If building(s) exceed 150 square feet	In process
Stearns County	Conditional Use Permit	Installation of station to station transmission services	In process
City of Rockville	_____	Deferred to Stearns Co. for permitting	_____
St. Joseph Township	_____	Permitting is done by Stearns Co.	_____
Stearns County Highway Department	County Highway Crossing Permit	Permit required prior to construction	In process
MN Dept. of Natural Resources (DNR)	Environmental Review – Wetlands, Water, Threatened and Endangered Species	Comprehensive review of transmission line and substation site impacts	The DNR has no comments on the project– e-mail dated 10/19/04
DNR Lands and Minerals	License to Cross Public Water	License required if project crosses DNR Public Waters	In process
MN Historical Society State Historic Preservation Office (SHPO)	SHPO Review of Nationally Registered Historic Places	Historic preservation	No historic properties will be affected by the project – letter of 10/7/04
Minnesota Dept. of Transportation (MnDOT) – Aeronautics	Airspace Concerns	Public and private airports/airstrips	The project will pose no hazard to public airports in the area – e-mail dated 11/16/04
MnDOT	State Highway Crossing Permit	Permit required prior to construction	In process
USDA Rural Utilities Service (RUS)	Environmental Review	Construction of 115 kV transmission line and substation upgrade	In process
USDA Natural Resources Conservation Service	Environmental Review	Wetland conservation and impact on unique, prime or statewide important farmland	Recommend use of BMPs to minimize erosion – letter of 9/29/04
US Dept. of Interior Fish and Wildlife Service	Threatened and Endangered Species Review	Review of records for federally threatened or endangered species at or near the substation site or transmission facilities	No federally listed species in the project area – e-mail dated 10/15/04
US Dept. of the Army Corps of Engineers	Wetland and Waterways Review	Review navigable water and the dredging or filling of US waters including wetlands	Proposed work not under COE jurisdiction – letter of 10/28/04

**Environmental Assessment
for the
Proposed Rockville 115 kV Project**

STEARNS COUNTY, MINNESOTA

STEARNS COUNTY

January 2005

5.0 AGENCY INVOLVEMENT, PUBLIC PARTICIPATION AND REQUIRED PERMITS AND APPROVALS

5.1 OVERVIEW OF MINNESOTA APPROVAL PROCESS

The state of Minnesota has established rules governing the siting of transmission structures. The rules govern both the need for the facility as managed by the Public Utilities Commission (Commission) and review of potential impacts to the environment as managed by the EQB. The facility is exempt from Commission review as the project length is less than the 10-mile threshold for 100 to 200 kV facilities (Minn. Stat. Section 216B.2421 Subd.2 (3)). The facility is deferred from EQB review as the rules allow for local review under a Conditional Use Permit (CUP) for facilities between 100 and 200 kV (Minn. Stat. Section 116C.576 Subd.2 (3)). See Appendix B for legal notices and media information.

5.2 LOCAL REVIEW

City and County zoning ordinances list uses for each zoning district, which include permitted, interim, and conditional uses. The proposed project will require a CUP from Stearns County. GRE's CUP application will be submitted to Stearns County for its review and to determine if the proposed project satisfies its respective planning criteria. An official public hearing will be a component of the Stearns County CUP process, thereby providing all interested parties a public forum in which to express their opinions and seek specific information pertaining to the project. Stearns County is the legal governing body for all activities that may require permitting in St. Joseph Township. The City of Rockville is self-governing in regard to permitting requirements within its corporate limits. However, Rockville city officials have deferred its permitting authority to Stearns County, as the project is predominantly located within the corporate limits of St. Joseph Township.

5.3 PUBLIC INVOLVEMENT

GRE and SEA held a public information meeting on the project on October 21, 2004 in Rockville, Minnesota. Local officials and landowners directly affected by the project were sent notice of the meeting (Appendix C). Three town board members attended the meeting. No members of the public were present at the meeting.

health effects. However, as with many other environmental health issues, the possibility of health risk from EMF cannot be dismissed."

These conclusions are consistent with those reached by the Department of Health in 2000 and similar to conclusions of scientific committees convened by the US Congress and national and international health agencies including a 1992 report by the NIEHS. There are presently no Minnesota regulations pertaining to magnetic field exposure.

4.16.2 Radio and Television Interference

Corona on transmission line conductors can generate electromagnetic noise at the frequencies at which radio and television signals are transmitted. This noise can cause interference with the reception of these signals depending on the frequency and strength of the radio and television signal. The potential for this type of interference is greatly reduced for the proposed transmission line at 115 kV and where wood poles are used. If interference occurs because of the power line, the electric utility would remedy problems so that reception is restored to its original quality.

4.17 Physical Safety

The proposed transmission line would be designed to meet or exceed all relevant state codes and the National Electric Safety Code. Appropriate standards would be met for construction and installation, and all applicable safety procedures would be followed during and after installation. The proposed transmission line would be equipped with protective devices to safeguard the public from the transmission line if an accident occurs and a structure or conductor falls to the ground. The protective equipment would de-energize the line when an event occurred. In addition, the substation facility would be fenced and access limited to authorized personnel.

4.18 HUMAN AND NATURAL ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED

Construction of the proposed transmission line would result in several human and natural environmental effects that cannot be avoided. Construction of the proposed transmission line would require removal of vegetation in a few locations where necessary to widen the existing ROW. Any crop damage or tree removal would be compensated with the respective landowners. There could be a temporary increase in noise and dust during construction.

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Electric Fields

The voltage in a transmission line generates an electric field, but the magnitude of the electric field rapidly decreases with distance from the conductor. There is no federal standard for transmission line electric fields. However, the EQB has imposed a maximum electric field limit of 8 kV/meter measured one meter above the ground. This standard was designed to prevent serious hazard from shocks when touching large objects parked under voltage transmission lines of 500 kV or greater. The proposed 115 kV line would have a maximum magnitude of electric field density of approximately 1.1 kV / meter underneath the conductors, one meter above ground level. Research on the biological effects of electric fields on animals and humans has been conducted. No significant association has been found between exposure to electric fields and disease in humans.

Magnetic Fields

Electric current passing through any conductor, including a wire, produces a magnetic field in the area surrounding the wire. The magnetic field associated with a high voltage transmission line surrounds the conductor and decreases rapidly with increasing distance from the conductor. The magnetic field is expressed in units of magnetic flux density, expressed as gauss (G).

Recent studies of the health effects from power-frequency fields conclude that the evidence of health risk is weak and there is little scientific evidence correlating extra low frequency EMF exposures with health risk (National Institute of Environmental Health, 2002; National Research Council, 1997; <http://www.health.state.mn.us/divs/eh/radiation/emf>).

The Minnesota State Interagency Working Group on EMF Issues, consisting of members from five state agencies, issued "A White Paper on Electric and Magnetic Field (EMF) Policy and Mitigation Options" in September of 2002 (Minnesota Department of Health, 2002). The Working Group concluded the following:

"Research on the health effects of EMF has been carried out since the 1970s. Epidemiological studies have mixed results – some have shown no statistically significant association between exposure to EMF and health effects, and some have shown a weak association. More recently, laboratory studies have failed to show such an association, or to establish a biological mechanism for how magnetic fields may cause cancer...

The Minnesota Department of Health (MDH) concludes that the current body of evidence is insufficient to establish a cause and effect relationship between EMF and adverse

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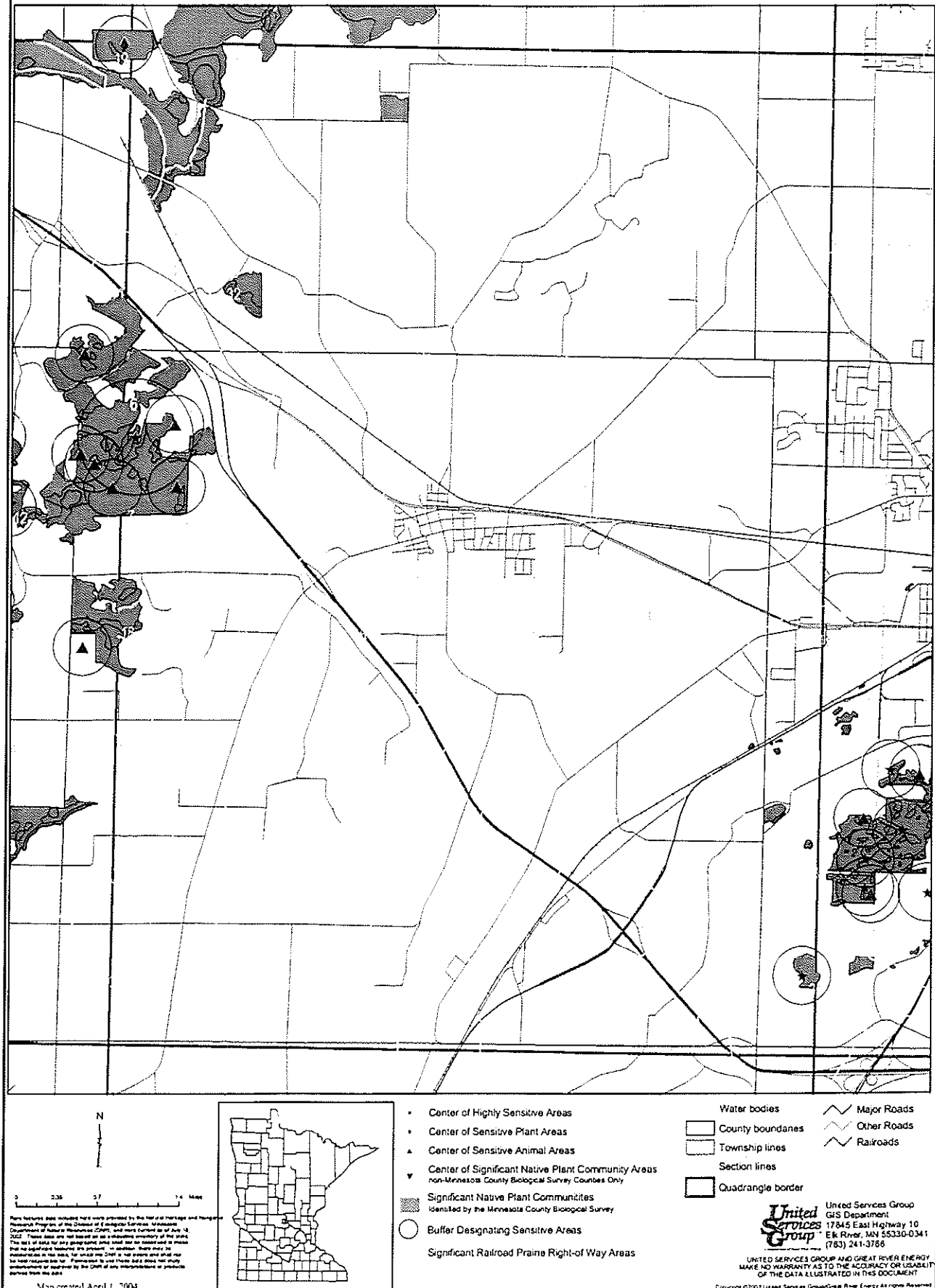
Appendix A Agency Correspondence

Appendix B Legal Notices and Media Information

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Appendix D Landowner Survey and Responses to Survey

FIGURE 6. Sensitive Areas
St. Joseph 1:24,000 U.S.G.S. Quadrangle (DNR Code = P12d)
Includes portions of Stearns County



1.0 EXECUTIVE SUMMARY

Great River Energy (GRE) and Stearns Electric Association (SEA) are proposing a joint 115 kilovolt (kV) project near Rockville in Stearns County, Minnesota (Figure 1). The proposed project includes construction of 3.75 miles of new GRE 115 kV transmission line and upgrading SEA's Rockville Substation from 34.5 kV to 115 kV. The project is needed to provide better reliability and to meet growing electrical needs in the area.

2.0 GENERAL DESCRIPTION OF THE PROPOSED PROJECT

2.1 PROJECT LOCATION

The proposed project is located in Sections 24, 25, 26, 34 and 35, Township 124 North, Range 29 West; and Section 3, Township 123 North, Range 29 West. The transmission line will generally follow the Trunk Highway 23 corridor from the existing SEA Rockville Substation northeasterly to its intersection with an Xcel Energy 115 kV transmission line, then continue northerly, parallel and adjacent to the Xcel Energy line to Xcel Energy's Sauk River Substation (Figure 2).

2.2 PROJECT NEED

GRE is the wholesale power supplier to Stearns Electric Association, who serves much of the area in and around Rockville. The existing electric transmission and distribution system serving this area needs to be upgraded to provide better reliability and increased capacity to meet the increasing load. The existing 34.5 kV system in this area is weak and historically has not satisfied reliability standards. Conversion to a 115 kV system would allow SEA to better transfer loads between multiple distribution substations during emergency situations and routine switching operations. An upgrade to a 115 kV system would meet customer's needs in the Rockville area for several decades.

2.3 SUMMARY OF PROJECT PROPOSAL

GRE proposes to construct and own 3.75 miles of new 115 kV transmission line between the SEA Rockville Substation and the Xcel Energy Sauk River Substation. SEA would upgrade the Rockville Substation from 34.5 kV to 115 kV. Although it is not part of this Environmental

1.4 WATER RESOURCES/WETLANDS

A letter was sent to the Minnesota Department of Natural Resources (DNR) requesting review of the proposed project for potential impact on water resources in or adjacent to the project corridor. In an e-mail dated October 19, 2004 (Appendix A), the DNR indicated that they had no comments on the project.

The proposed transmission route would cross one DNR Public Water (594W), which is a wetland. GRE will apply to the DNR Division of Lands and Minerals for a license to cross this wetland. This will consist of the placement of the pole only and will not involve bringing any fill into the wetland. Appropriate erosion control measures such as silt fences would be installed as appropriate to minimize erosion or damage that could compromise the character of the wetland. The transmission line will cross some minor drainages that will be spanned. When stringing electrical conductor across bodies of water, ropes are affixed to the conductor wire and then pulled up and across the body of water to pulleys attached to the cross-arms on the poles. GRE crews and contractors always exercise caution when working along the banks of water bodies.

1.5 FISH/WILDLIFE RESOURCES AND THREATENED AND ENDANGERED SPECIES

Letters were sent to the U.S. Fish and Wildlife Service (USFWS) and the DNR requesting review of the proposed project for potential effects to known federally and state-listed threatened and endangered species and rare natural features. An e-mail from the USFWS dated October 15, 2004 (Appendix A) indicated that there are no federally listed species in the project area. An e-mail from the DNR dated October 19, 2004 (Appendix A) indicated that they have no comments on the project. The Natural Heritage database was reviewed and there are no Sensitive Areas in the vicinity of the project (Figure 6).

1.6 HUMAN HEALTH AND SAFETY

4.16.1 Electromagnetic Fields

The term electromagnetic fields (EMF) refer to electric and magnetic fields that are coupled together such as in high frequency radiating fields. For lower frequencies such as for power lines, EMF should be separated into electric and magnetic fields. EMF arises from the flow of electricity and the voltage of a line. The intensity of the electric field is related to the voltage of the line and the intensity of the magnetic field is related to the current flow through the conductors.

lower atmosphere from lightning discharges and from reactions between solar ultraviolet radiation and air pollutants such as hydrocarbons from auto emissions.

The natural production rate of ozone is directly proportional to temperature and sunlight and inversely proportional to humidity. Thus, humidity (or moisture), the same factor that increases corona discharges from transmission lines, inhibits the production of ozone. Ozone is a very reactive form of oxygen and combines readily with other elements and compounds in the atmosphere. Because of its reactivity, it is relatively short-lived.

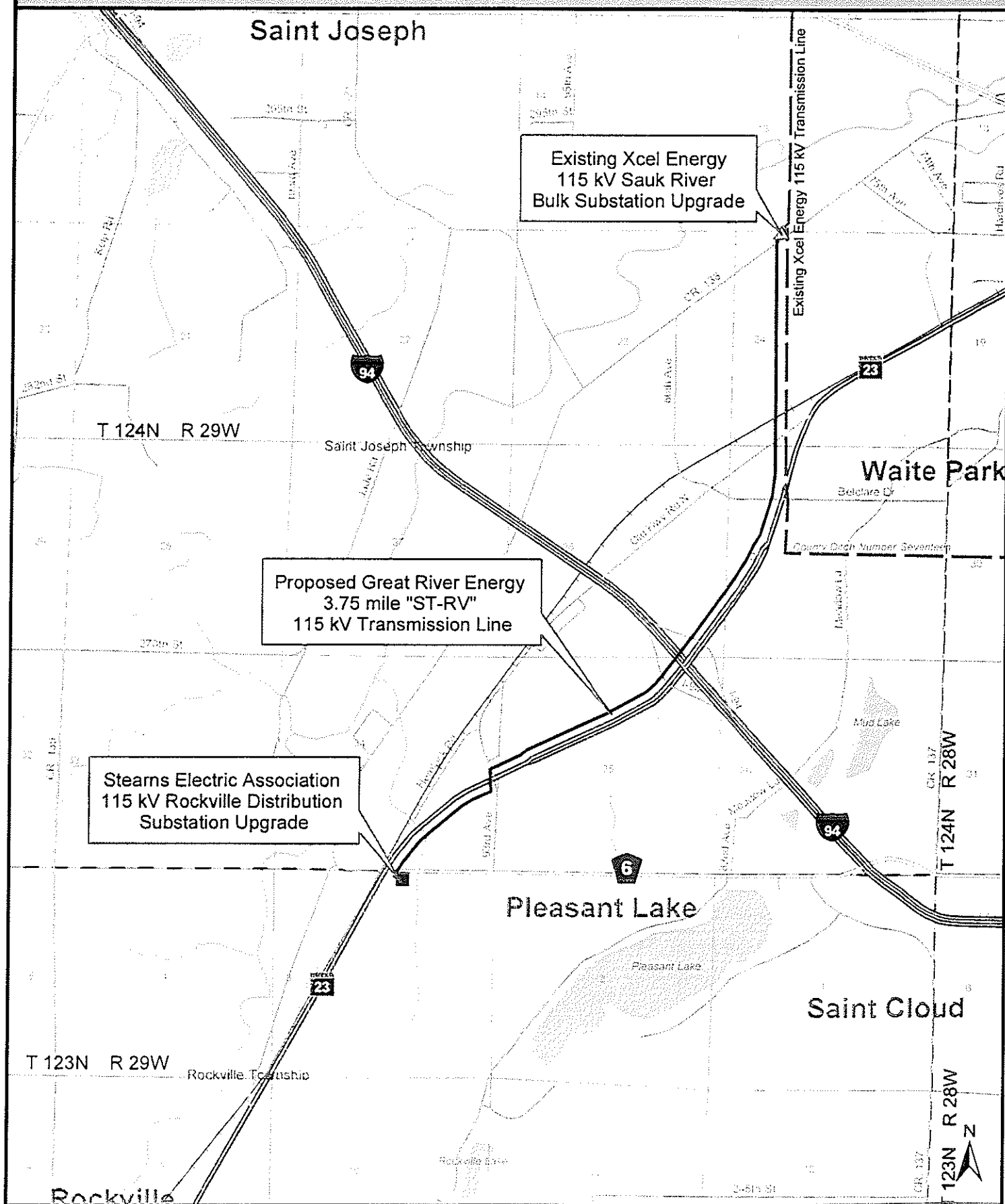
Currently, both state and federal governments have regulations regarding permissible concentrations of ozone and oxides of nitrogen. The national standard is 0.08 ppm on an eight-hour averaging period. The state standard is 0.08 ppm based upon the fourth-highest eight-hour daily maximum average in one year. Calculations using the Bonneville Power Administration (BPA) Corona and Field Effects Program Ver. 3 (USDOE, BPA Undated) for a standard single circuit 115 kV project predicted the maximum concentration of 0.008 ppm near the conductor and 0.0003 ppm at one meter above ground during foul weather or worst-case conditions (rain at 4 inches per hour). During a mist rain (rain at 0.01 inch per hour) the maximum concentrations decreased to 0.0003 ppm near the conductor and 0.0001 ppm at one meter above ground level. For both cases, these conservative calculations of ozone levels are well below the federal and state standards. Studies designed to monitor the production of ozone under transmission lines have generally been unable to detect any increase due to the transmission line facility.

4.13.2 Construction Emissions

During construction of the proposed transmission line and substation modifications, there would be emissions from vehicles and other construction equipment and fugitive dust from ROW clearing. Temporary air quality impacts caused by the proposed construction-related emissions would be expected to occur during this phase of activity. The magnitude of these emissions is influenced heavily by weather conditions and the specific construction activity taking place. Adverse impacts to the surrounding environment would be minimal because of the short and intermittent nature of the emission and dust-producing construction phases.

FIGURE 2.

PROJECT MAP



compaction occurs, the construction crews or a restoration contractor would use various methods to alleviate the compaction as negotiated with landowners.

4.10 VEGETATION

Clearing of trees and vegetation would be necessary in some areas for transmission line installation. The reseeded of areas disturbed by construction activities would be with vegetation similar to that which is removed, and restoring areas to their original condition to the extent possible.

4.11 MINING

The proposed transmission line corridor passes through a designated gravel mining area for 0.75 mile in Section 24. The active gravel mining operation is currently concentrated on property that is one-quarter to one-half mile west of the proposed transmission line corridor. An "Interim Use" permit was approved by Stearns County in 2000, allowing mining activities through the year 2035. Because the proposed GRE transmission line corridor is directly adjacent to the existing Xcel Energy 115 kV line, the impact to future gravel mining operations along this route will not be adversely impacted.

4.12 ARCHAEOLOGICAL AND HISTORIC RESOURCES

A letter was sent to the Minnesota State Historic Preservation Office (SHPO) requesting review of the proposed project for potential impact on archaeological and historic resources in or adjacent to the project corridor. In a letter dated October 7, 2004 (Appendix A), the SHPO stated that no properties eligible for or listed on the National Register of Historic Places are within the project's area of effect.

4.13 AIR QUALITY

4.13.1 Ozone and Nitrogen Oxide Emissions

Corona can produce ozone and oxides of nitrogen in the air surrounding the conductor. Corona consists of the breakdown or ionization of air in a few centimeters or less immediately surrounding conductors. For a 115 kV transmission line, the conductor gradient surface is usually below the air breakdown level. Usually some imperfection such as a scratch on the conductor or a water droplet is necessary to cause corona. Ozone also forms naturally in the

Assessment (see Section 3.2.2), Xcel Energy would modify the Sauk River Substation from an "in and out" configuration to a 4-position ring bus configuration to accommodate the new 115 kV line.

2.4 PROJECT SCHEDULE

Permitting activities and the environmental review started in fall 2004 and will continue into the first part of 2005. Easement acquisition is tentatively scheduled to occur in spring 2005. Construction of the transmission line and substation modifications is proposed to begin in fall 2005. The anticipated in-service date is December 2005.

3.0 ENGINEERING DESIGN, CONSTRUCTION AND RIGHT-OF-WAY ACQUISITION

3.1 TRANSMISSION LINE

3.1.1 Route Description

The new 115 kV transmission line would exit the SEA Rockville Substation, which is located near the intersection of Trunk Highway 23 and Stearns County Road 6. It would proceed northeasterly along Highway 23 for approximately 1.75 miles, cross over Interstate 94, continue northeasterly along Highway 23 for approximately 0.75 mile, then continue north parallel to Xcel Energy's 115 kV transmission line for 1.25 miles to the Sauk River Substation (see Figure 2).

3.1.2 Overhead Structure Design

The proposed transmission line would likely consist of shielded 336 ACSR 115 kV conductors. The structures would be primarily single shaft wood poles with horizontal post insulators with a typical height of 70-80 feet. A typical single wood structure and typical right-of-way (ROW) widths are shown in Figure 3.

3.1.3 Construction and Maintenance Procedures

Construction is planned to begin in fall 2005, depending on when required approvals are obtained and easement acquisition is completed. The proposed 115 kV transmission line would be constructed at grade elevations; therefore, no pole locations would require grading unless it is necessary to provide a level area for construction access and activities. Construction would comply with the latest industry standards. As a Rural Utilities Service (RUS) borrower, GRE adheres to RUS standards regarding clearance to ground, clearance to crossing utilities,

FIGURE 5. Stearns County Official Zoning St Joseph Township

Stearns County Environmental Services
Stearns County Zoning Ordinance #209, April 21, 2000

Amended By Ordinance #214, August 15, 2000
Amended By Ordinance #279, March 18, 2003
Amended By Ordinance #289, August 5, 2003

This map is made available on an "as is" basis without express or implied warranty of any sort, including specifically, any implied warranties of fitness for a particular purpose, warranties of merchantability or warranties relating to the accuracy of the database.

0 2,600 5,200
Feet

Functional Road Class

— Principal Arterial
— Minor Arterial
— Major Collector
— Minor Collector

— Airport Boundary
— Growth Boundary
— Protected Rivers and Streams
— Section Lines
— Roads

Zoning Districts

Agricultural District A-160
 Agricultural District A-80
 Agricultural District A-40
 Commercial/Recreational (CR)
 Educational/Ecclesiastical (EE)
 General Industrial (GI)
 Limited Industrial (LI)
 Municipality
 Protected Lake
 Residential District R-1
 Residential District R-5
 Residential District R-10
 Residential District R-20
 Residential Manufactured Home (RMH)
 Rural Townsite (RT)
 Scenic River District (SR)
 Transition District T-20

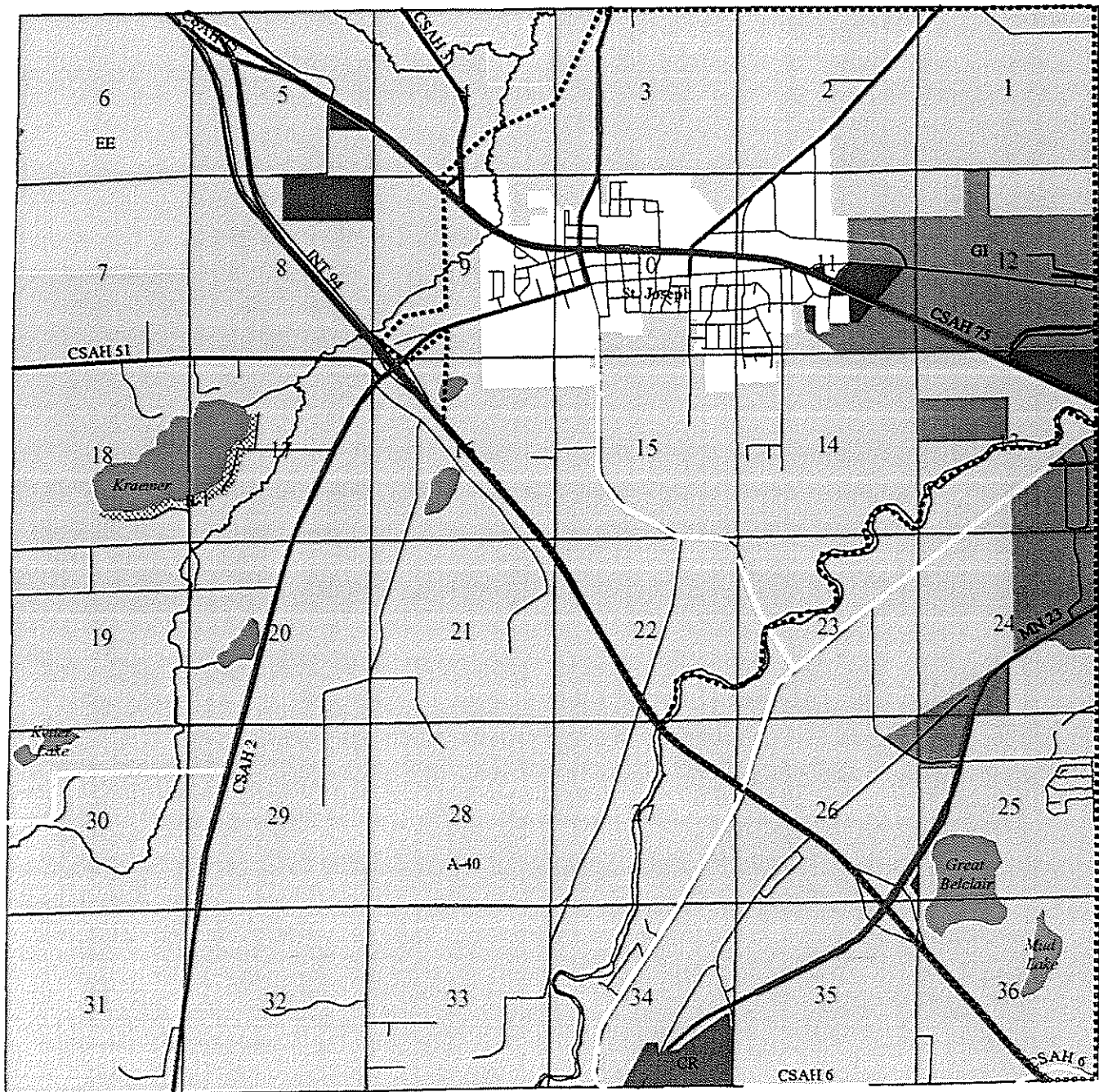
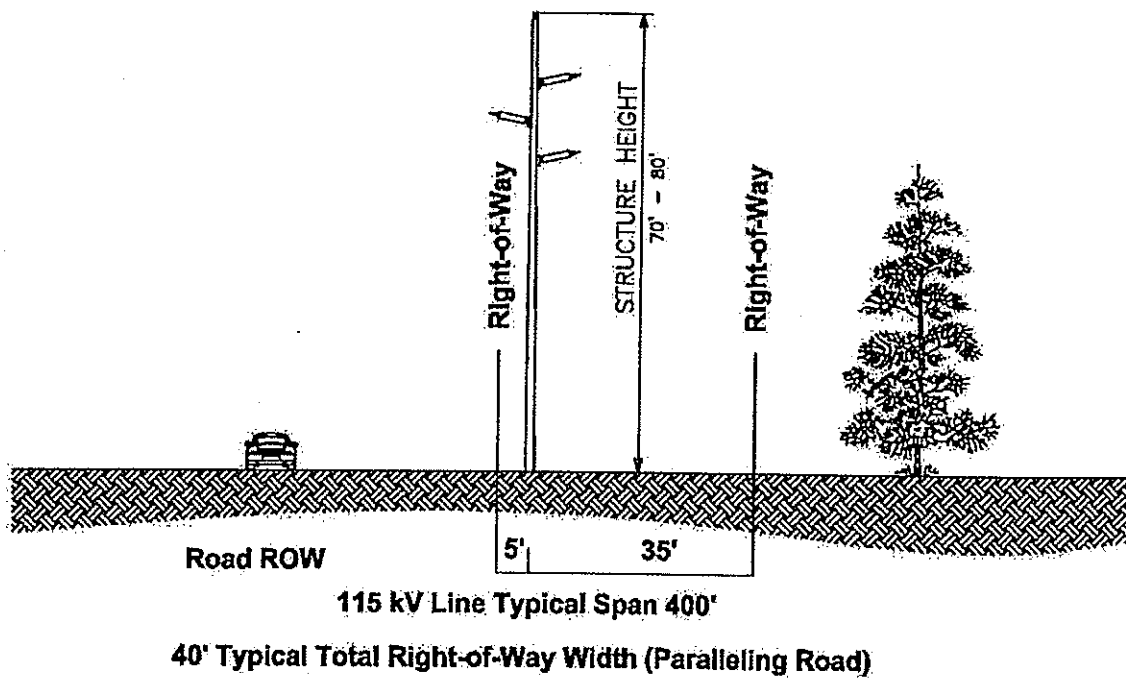


Figure 3

115 kV Horizontal Post Structure



4.7 TRANSPORTATION

The proposed transmission line will be built along or parallel to existing utility or road ROW. The proposed transmission line would cross interstate, state, county, city or township roads at several places. Temporary road closures or land reductions may be necessary during construction of the transmission line. Operation of the proposed transmission line will not affect the major roads in the area (Trunk Highway 23 and Interstate 94). In an e-mail dated November 16, 2004 (Appendix A), the Minnesota Department of Transportation, Office of Aeronautics indicated that the project would pose no hazard to public airports in the area.

4.8 LAND USE/ZONING

The proposed transmission line corridor site is a mix of land uses consisting of rural, commercial/recreational, agricultural and general industrial (see Figure 5). The new 115 kV transmission line will exit the SEA Rockville Substation, which is located near the intersection of Trunk Highway 23 and Stearns County Road 6, and traverse an area zoned Commercial/Recreational CR for approximately 0.5 miles. It continues northeasterly along Highway 23 for approximately two miles (crossing over Interstate 94) through an area zoned Agricultural A-40. The last 1.25 miles paralleling Xcel Energy's 115 kV transmission line traverses land that consists of 0.5 miles that is used as a trucking depot (designated General Industrial GI), and approximately 0.75 miles of land currently used as agricultural cropland but permitted to be mined until the year 2035 (presently zoned Agricultural A-40). Stearns County Land Use and Zoning Ordinance 209 requires a Conditional Use Permit (CUP) for this project.

4.9 SOILS/PRIME FARMLAND

A letter was sent to the Natural Resources Conservation Service (NRCS) requesting review of the proposed project for potential impact soils and prime farmland in or adjacent to the project corridor. In a letter dated September 29, 2004 (Appendix A), the NRCS indicated that there are approximately 14.2 acres of prime and unique farmland that would be affected by the project area. Although the proposed transmission line ROW would impact some farmland, most of the disturbance will be limited to the area immediately surrounding the transmission structures. GRE would work with landowners to minimize impacts to farmland. This would include scheduling work to minimize impacts to crops and land. GRE representatives would work directly with landowners to address crop damages or impacts to farmland. In cases where soil

clearance to buildings, ROW widths, erecting power poles, and stringing of transmission line conductors.

Typical pole structures would require a hole dug 10 to 15 feet deep and 3 to 4 feet in diameter for each pole. Pole structures in wet environments or angle structures may require additional foundation support, typically consisting of a concrete foundation or placement of the pole base inside a vertical galvanized steel culvert. Erosion control methods would be implemented to minimize runoff during construction. A GRE contractor would perform transmission line construction in compliance with local, state, National Electrical Safety Code (NESC), and GRE standards.

Poles would be delivered to either the staked location or a project storage yard. If the poles were delivered to a staked site, they would be placed on the ROW out of the clear zone of any adjacent roadways or designated pathways. Insulators and other hardware would typically be attached while the pole was on the ground. The pole would then be lifted, placed and secured on the foundation by a bucket truck or crane.

Once the structures have been erected, conductors would be installed by establishing stringing setup areas within the ROW. The stringing setup areas would usually be established every two miles along the project route. Conductor stringing operations also require brief access to each structure to secure the conductor wire to the insulators or to install shield wire clamps once final sag is established. Temporary guard or clearance poles would be installed, as needed, over existing distribution or communication lines, streets, roads, highways, railways or other obstructions after any necessary notifications were made or permits obtained. This ensures that conductors would not obstruct traffic or contact existing energized conductors or other cables. In addition, the conductors would be protected from damage.

GRE would periodically use the transmission line ROW to perform inspections, maintain equipment, and repair any damage. GRE would also conduct regular route maintenance for weed control and removal of undesired vegetation that would interfere with the operation of the proposed transmission line.

During construction, limited ground disturbance at the structure sites may occur. Disturbed areas would be restored to their original condition to the maximum extent practicable as negotiated with the landowner. Post-construction reclamation activities include:

In Minnesota, state rules have been established to regulate noise levels by land use types. Land uses such as picnic areas, churches or commercial land are assigned to an activity category based on the type of activities occurring in each respective land use. Activity categories are then categorized based on their sensitivity to traffic noise. The Noise Area Classification (NAC) is listed in the MPCA noise regulations to distinguish the categories.

Noise emission from a transmission line increases during heavy rain and wet conductor conditions. In foggy, damp, or rainy weather conditions, power lines can create a crackling sound due to the small amount of electricity ionizing the moist air near the wires. During heavy rain, the general background noise level is usually greater than the noise from the transmission line and few people would be out near the transmission line. As a result, people do not normally notice audible noise from a transmission line during heavy rain. This is confirmed by calculated levels during a heavy rain (one inch per hour) that shows noise levels for a 115 kV line at less than 25% of the most sensitive state NAC (NAC 1). During light rain, dense fog, snow, and other times when there is moisture in the air, transmission lines will produce audible noise at approximately household background levels. During dry weather, audible noise from transmission lines is barely perceptible. The proposed substation would be designed and constructed to comply with state noise standards.

4.4 AESTHETICS

The proposed transmission line will follow existing road ROW or parallel utility ROW for the entire route. The proposed transmission line will be constructed using single poles that are approximately 70 to 80 feet high. Visual impacts would be limited to the immediate corridor.

4.5 RECREATION

The proposed transmission line corridor is not adjacent to any recreation areas and should not affect recreational use of the area in any way.

4.6 PUBLIC SERVICES

The proposed transmission line will be built adjacent or parallel to existing road or utility ROW. Impacts to other utilities (gas, telephone, electric, water, sewer) will be avoided or minimized. Public services would not be affected by the construction and operation of the proposed transmission line.

- removing and disposing of debris,
- removing all temporary facilities (including staging and laydown areas),
- employing appropriate erosion control measures,
- reseeding and mulching areas disturbed by construction activities with vegetation similar to that which was removed and,
- restoring the areas to their original condition to the extent possible.

In cases where soil compaction has occurred, the construction crews or a restoration contractor uses various methods to alleviate the compaction as negotiated with landowners.

3.2 SUBSTATION MODIFICATIONS

3.2.1 SEA Rockville Substation

The existing Rockville Substation was reconstructed in the early 1990's. The substation is owned by SEA and was designed to accommodate a 69 kV transmission source. The new 115 kV source requires modification to the high side structure where the transmission line enters the substation (west side). The modification requires replacing the high side with a taller and wider structure to accommodate the spacing required for 115 kV. A new high side switch will be placed on the structure along with the substation fusing equipment. GRE will own the high side facilities.

SEA will replace the existing transformer in the substation with a unit that will convert the 115 kV source to the 7.2/12.5 kV distribution voltage exiting the station. The intent is to use the existing cement slab for the new transformer. This will be determined in early 2005 when the transformer dimensions are obtained.

The low voltage structure (east half) will require no modifications. However, two of the four breakers installed on the structure will be replaced with units to handle the higher short circuit currents available as a result of the transmission upgrade.

A typical 115 kV substation is shown below in Figure 4.

4.3 NOISE

Noise is comprised of a variety of sounds of different intensities, across the entire frequency spectrum. Humans perceive sound when sound pressure waves encounter the auditory components in the ear. These components convert these pressure waves into perceivable sound. Transmission conductors and transformers at substations produce noise under certain conditions. The level of noise or its loudness depends on conductor conditions, voltage level, and weather conditions.

Noise is measured in units of decibels (dB) on a logarithmic scale. Because human hearing is not equally sensitive to all frequencies of sound, certain frequencies are given more "weight". The A-weighted scale corresponds to the sensitivity range for human hearing. Noise levels capable of being heard by humans are measured in dBA, the A-weighted sound level recorded in units of decibels. A noise level change of 3 dBA is barely perceptible to human hearing. A 5-dBA change in noise level, however, is clearly noticeable. A 10-dBA change in noise levels is perceived as a doubling of noise loudness, while a 20-dBA change is considered a dramatic change in loudness. Table 1 below shows noise levels associated with common, everyday sources, and helps the reader more fully understand the magnitude of noise levels discussed here.

Table 1
Common Noise Sources and Levels

Sound Pressure Level (dB)	Typical Sources
120	Jet aircraft takeoff at 100 feet
110	Jet aircraft at 400 feet
90	Motorcycle at 25 feet
80	Garbage disposal
70	City street corner
60	Conversational speech
50	Typical office
40	Living room (without TV)
30	Quiet bedroom at night

Source: Environmental Impact Analysis Handbook, ed. By Rau and Wooten, 1980

Figure 4. Typical 115 kV Substation



3.2.2 Xcel Energy Sauk River Substation

The substation modifications at Xcel Energy's Sauk River Substation involve modifying the existing "in and out" configuration to a 4-position ring bus configuration. This work is covered by the Minnesota Environmental Quality Board (EQB) rules under permitted uses and therefore is not part of this Environmental Assessment.

3.3 ROW ACQUISITION

After project approvals to construct the transmission line are secured, landowners will be contacted by representatives of GRE to begin direct negotiations to acquire easements and purchase any land rights necessary for transmission line construction (see Appendix A). As the design of the line is developed, landowners will be contacted to discuss the project in detail and in preparation for any necessary surveys and soil investigations.

Once easements, permits and land rights have been acquired, and immediately prior to construction, individual property owners will be contacted to discuss the construction schedules, access to the site and vegetation clearing required for the project. The ROW would be cleared of the amount of vegetation necessary to construct, operate and maintain the proposed transmission line. Wood from the clearing operation will be offered to the landowner or removed from the site. Brush will be chipped and disposed of on the ROW. It is standard practice to remove any vegetation species that would be a danger to the line when at a mature height. Also, any vegetation that is in the way of construction equipment may have to be removed.

Some structure locations may require soil analysis to assist with the design of the line. Soil borings would be taken to determine the soil properties for engineering analysis. An independent geotechnical testing company would take and analyze these borings. Site access would be required and landowners would be contacted for permission.

In addition to the ROW required for adequate clearance of the proposed transmission line, temporary construction easements may be obtained from landowners for the duration of construction. These construction easements would need to be limited to special construction access needs or any additional staging or laydown areas required outside of the proposed transmission line ROW. Where possible, staging and laydown areas would be located within the ROW and limited to previously disturbed or developed areas. Upon completion of construction activities, landowners will be contacted to determine if any additional restoration due to construction damage is necessary.

4.0 ENVIRONMENTAL ANALYSIS

4.1 DESCRIPTION OF ENVIRONMENTAL SETTING

The proposed transmission line corridor traverses a mix of land types consisting of rural, commercial/recreational, agricultural and general industrial land uses. For decades, the land use was predominantly rural, but the influence of urban growth in the area will result in a gradual transition to commercial and industrial land uses. In addition, a large segment of Section 24 has been locally permitted for "Interim Use" gravel mining through the year 2035. During the last 10 years, Trunk Highway 23 has been realigned and reconstructed as a four-lane divided highway. Orderly annexation of southeastern St. Joseph Township by the City of Waite Park, specifically the area southeast of the Sauk River and northeast of Interstate 94, will occur over the next several years.

4.2 HUMAN SETTLEMENT

The proposed transmission line corridor runs through a predominantly rural setting with no residences within 500 feet of the proposed transmission line. The transmission corridor skirts near several commercial/industrial businesses, primarily a vehicle repair shop and an over-the-road trucking depot. Consequently, the impact of this project on human settlement is minimal.